



PHDP II

**Technical assistance to MAIL
to strengthen the planting material and horticulture industry in Afghanistan
(Europe Aid/129-320/C/SER/AF/2)**

Mission report on Orchard management and Value Chain

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Best Regards,

Prof. Ghulam Rasoul Samadi

November, 2015

Executive Summary

Grapes are the biggest perennial fruit crop in Afghanistan and an increasingly important late season production area for table grapes for the Kabul market is the Shomali plain. Due to the absence of seeds, the Keshmeshi and Shondukhani grapes tend to produce small berries which are less acceptable on the fresh market, and can only achieve low prices.

The current problems include wrong timing of GA3 applications, and overdosing, which can promote tight berry clusters and introduction of fungal rots. GA3 is readily available in agricultural supply merchant stores, in tablet form in Afghanistan.

On other hand, White and Red Roucha are the very early maturing grape varieties that produced very compact clusters with fungal rots inside the clusters. The GA3 can use for the thinning of the berry before and during the flowering times on White and Red Roucha grape varieties for the purpose of looseness of clusters.

The present experiments follow the ones conducted last year which failed due to powdery mildew and shortage of water.

These trails were conducted to evaluate the effect of the time and different concentration GA3 application on cluster compactness, quality improvement and production of White Roucha, Red Roucha and Shondukhani varieties of grapes in Kandahar, Herat and Shakardara district/Kabul provinces during April – Oct. 2015.

The result of experiment has shown that treatment 7 (20 ppm at 40% flower opening +20 ppm at 80% flower opening on the treated bunch) for White Roucha and treatment number 3(10 ppm GA3 before flowering on the treated bunch) for Red Roucha are appropriate treatments for high yield.

The results of the experiments have shown that the application of GA3 10 ppm before flower opening + 60 ppm GA3 at 4 mm berry size (treatment # 8) and treatment 9 (20 ppm GA3 before flower opening + 60 ppm GA3 at 4 mm berry) were significant in both White and Red Roucha varieties for producing of loose cluster, good production and quality.

The result of experiment on Shondukhani grapes has shown that treatment # 9 (80 ppm GA3 at berry size 10 mm) is appropriate treatment for high yield, good quality and marketability.

SUMMARY OF PROVISIONAL RESULTS AND RECOMMENDATIONS

Variety	Recommended doses and timing for flower thinning and berry sizing	Recommended timing of treatment	Remarks
White Roucha	GA3 @10 ppm before flower opening plus GA3 @ 60 ppm at 4 mm berry size	Before flowering and at @ 4 mm berry size	
Red Roucha	GA3 @10 ppm before flower opening plus GA3 @ 60 ppm at 4 mm berry size	Before flowering and at @ 4 mm berry size	
Shondukhani	GA3@ 80 ppm	At berry size @ 10 mm	

I. Effect of gibberellin effect on flower thinning and berry sizing of White and Red Roucha, PHDC/Kandahar and Herat, April-July, 2015

Researchers: Prof. Gh.R. Samadi, Saifudin Ahadi, Ahmad Shah Zarghon

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Introduction

Grapes are the most important fruit crop and more than 100 grape varieties are grown in Afghanistan. Based on the maturity, there are three types of varieties such as early maturing (White Roucha, Red Roucha, Red Kandahari, etc.), medium maturing varieties (Kishmeshi, Hussaini, etc.) and late maturing (Taifi, Gholadan, etc.). White and Red Roucha are the very early maturing grape varieties and they produce very compact clusters with fungal rots inside the clusters.

The technology to improve berry size, thinning and marketability of seedless grapes was already common practice around the world forty years ago, using the naturally occurring plant hormone gibberellic acid or GA3.

Many growers in Afghanistan, especially in Shamali plain, Kandahar and other areas use GA3 on seedless grape varieties, but the growers never use GA3 on White and Red Roucha grape varieties for the purpose of looseness of clusters.

Method and materials

The experiments were conducted to evaluate the effect of GA3 application on cluster compactness, quality improvement and production of white and Red Roucha variety of grapes in PHDCs of Kandahar and Herat provinces during April – July, 2015.



Picture-1: Selecting of vines for trials

The trial was laid out in Randomized Complete Block Design with one vine per treatment, and then 4 replications (one cluster per replication from targeted vine randomly was selected).

Treatments:

Treatment 1: control

Treatment 2: 10 ppm GA3 before flowering on the treated bunch

Treatment 3: 20 ppm GA3 before flowering on the treated bunch

Treatment 4: 10 ppm GA3 at 40% flower opening on the treated bunch

Treatment 5: 10 ppm at 40% flower opening +10 ppm at 80% flower opening on the treated bunch

Treatment 6: 20 ppm at 40% flower opening on the treated bunch

Treatment 7: 20 ppm at 40% flower opening +20 ppm at 80% flower opening on the treated bunch

Treatment 8: 10 ppm GA3 before flower opening + 60 ppm GA3 at 4 mm berry size

Treatment 9: 20 ppm GA3 before flower opening + 60 ppm GA3 at 4 mm berry size

After harvesting, the following data were collected, and then Analysis of variance and Least Significant Difference test (LSD) were made for most of the characters such as weight of cluster, cluster compactness, cluster length, berry diameter, berry length, brix %, berry firmness, berry color and taste.



Picture-2: Harvesting of trials

Statistical Analysis

Experiments were analyzed as RCBD and LSD test was used for treatments comparison.

1. Effect of gibberellin effect on flower thinning and berry sizing of White Roucha, PHDC/Kandahar, April-July, 2015.

Table-1: Yield and yield components of gibberellin effect on flower thinning and berry sizing of white Roucha trial.

#	Treatments	Weight of cluster/gr	Cluster compactness	Cluster diameter/cm	Cluster length/ cm	Berry diameter mm	Berry length mm	Brix %	Berry firmness	Berry color	Taste
1	Control	270.67 ab	2.33 bc	12.00 a	15.67a	12.78 abc	14.00 cd	11.00 c	1.92 a	1.92 b	2.25 a
2	10 ppm GA3 before flowering on the treated bunch	283.33 a	2.75 a	11.33 ab	16.33 a	12.44 bc	13.55 d	16.50 b	1.83 a	2.50 a	1.58 bc
3	20 ppm GA3 before flowering on the treated bunch	331.00 a	1.75 d	10.67 abc	16.33 a	13.22 ab	14.22 bcd	18.33 ab	1.33 b	1.42 c	1.58 bc
4	10 ppm GA3 at 40% flower opening on the treated bunch	171.33 c	2.08 bcd	10.00 abcd	16.33 a	12.00 c	13.22 d	19.33 a	1.75 a	1.50 c	1.50 bc
5	10 ppm at 40% flower opening +10 ppm at 80% flower opening on the treated bunch	293.33 a	2.75 a	10.33 abcd	14.67 ab	13.33 a	15.44 a	19.00 a	1.17 bc	1.50 c	1.92 ab
6	20 ppm at 40% flower opening on the treated bunch	211.67 bc	2.00 cd	9.67 bcd	14.67 ab	12.55 abc	14.89 abc	18.67 a	1.67 a	1.50 c	1.42 bc
7	20 ppm at 40% flower opening +20 ppm at 80% flower opening on the treated bunch	301.33 a	2.42 ab	10.00 abcd	11.67 c	13.33 a	15.11 ab	18.17 ab	1.17 bc	1.25 cd	1.58 bc
8	10 ppm GA3 before flower opening + 60 ppm GA3 at 4 mm berry size	169.00 c	1.25 e	9.00 cd	14.67ab	13.11 ab	14.66 abc	18.00 ab	1.17 bc	1.42c	1.42 bc
9	20 ppm GA3 before flower opening + 60 ppm	155.33 c	1.00 e	8.33 d	12.67bc	13.33 a	15.22 ab	18.67 a	1.00 c	1.00 d	1.17 c

	GA3 at 4 mm berry										
	Grand mean	243	2.04	10.15	14.78	12.90	14.48	17.52	1.44	1.56	1.60
	F-test	**	**	Not significant	*	**	**	**	Not significant	Not significant	Not significant
	LSD at 5 %	68.20	0.3744	2.315	2.304	0.7940	1.084	2.017	0.4166	0.21	0.6418
	CV %	19	13	16	11	4	5	8	15	18	27

Means within the same column followed by the same letter are not different at 5% level of significance.

2. Effect of gibberellin effect on flower thinning and berry sizing of Red Roucha, PHDC/Herat, April-July, 2015.

Table-2: Yield and yield components of gibberellin effect on flowering thinning and berry sizing of Red Roucha trial.

#	Treatments	Weight of cluster/gr	Cluster compactness	Cluster diameter/cm	Cluster length/ cm	Berry diameter mm	Berry length mm	Brix %	Berry firmness	Berry color	Taste
1	Control	334.67d	2.00 c	13.33 ab	21.33 abc	10.33 d	9.67 b	14.80 e	2.00 a	2.00 b	2.67 a
2	10 ppm GA3 before flowering on the treated bunch	651.00 a	3.00 a	11.33 abc	18.67 bcd	14.33 a	11.00 a	16.23 de	1.25 c	3.00 a	2.67 a
3	20 ppm GA3 before flowering on the treated bunch	Off type	Off type	Off type	Off type	Off type	Off type	Off type	Off type	Off type	Off type
4	10 ppm GA3 at 40% flower opening on the treated bunch	443.00 cd	2.00 c	13.67 a	23.33 a	12.33 bc	10.33 ab	19.43 bc	1.92 a	1.00 c	1.00 b
5	10 ppm at 40% flower opening +10 ppm at 80% flower opening on the treated bunch	511.00 abc	3.00 a	11.00 bc	18.33 cd	13.33 ab	10.67 a	23.33 a	1.50 b	2.00 b	1.33 b
6	20 ppm at 40% flower opening on the treated	470.33	2.17 b	10.00 c	20.67	11.67	10.67 a	20.47	1.67 b	1.00	2.33

	bunch	bcd			abcd	cd		b		c	a
7	20 ppm at 40% flower opening +20 ppm at 80% flower opening on the treated bunch	593.67 ab	3.00 a	12.67 ab	17.67 d	13.33 ab	10.67 a	23.07 a	1.00 d	2.00 b	2.33 a
8	10 ppm GA3 before flower opening + 60 ppm GA3 at 4 mm berry size	632.33 a	3.00 a	12.00 abc	22.00 ab	13.67 ab	10.67 a	18.07 cd	1.00 d	3.00 a	3.00 a
9	20 ppm GA3 before flower opening + 60 ppm GA3 at 4 mm berry	413.00 cd	3.00 a	9.67 c	19.00 bcd	14.00 a	10.67 a	17.47 cd	1.50 b	2.92 a	2.67 a
	Grand mean	506.13	2.65	11.71	20.13	12.88	10.54	19.11	1.48	2.11	2.25
	F-test	**	**	Not significant	*	**	*	**	**	**	**
	LSD at 5 %	146.6	0.1301	2.458	3.413	1.636	0.7461	2.228	0.1819	0.08945	0.7695
	CV %	20	5	14	12	9	5	8	8	3	23

Means within the same column followed by the same letter are not different at 5% level of significance.

Results and Discussions

1. Weight of cluster

The yield data on table 1 and 2 of the GA3 trial showed that there is significant difference between treatments. According to the LSD test, only the treatment 7 (20 ppm at 40% flower opening +20 ppm at 80% flower opening on the treated bunch of white Roucha) has significant difference with control and other treatments. Although, the treatment 3 was off type in Red Roucha, the table -2 showed that all other treatments were significantly different with control.

It means, the weight of cluster in treatment 7 is higher than cluster of other treatments, although, the treatment was not available in Red Roucha, but other treatments showed significant difference with control.



Picture-4: Collecting data

2. Cluster compactness

The scoring system for cluster compactness are compact = 3, medium = 2 and loose = 1.

The statistical analysis of the GA3 trial in table 1 and 2 shows that there were significant differences between treatments. According to the LSD test, the treatments 8 (10 ppm GA3 before flower opening + 60 ppm GA3 at 4 mm berry size) and treatment 9 (20 ppm GA3 before flower opening + 60 ppm GA3 at 4 mm berry) have significant difference with control in White Roucha, while in Red Roucha, the 2, 5, 7, 8 and 9 treatments have significant effect on cluster compactness. The results of the above mentioned treatments showed that the application of GA3 10 ppm GA3 before flower opening + 60 ppm GA3 at 4 mm berry size) and treatment 9 (20 ppm GA3 before flower opening + 60 ppm GA3 at 4 mm berry) have good effect. Picture-5: Collecting data



3. Cluster length

The yield data on table 1 and 2 of the GA3 trial shows that there were significant differences between treatments. According to the LSD test, the treatments, except treatment 9, others do not have any significant differences with control.

4. Cluster diameter

The statistical analysis of the GA3 trial on table 1 and 2 showed that there were no significant differences between treatments in both Roucha varieties. None of the cluster diameter is significantly better than check, but among the treatments, 20 ppm GA3 before flowering on the treated bunch is better than other treatment except control in both Roucha varieties.

5. Berry diameter

The yield data on table 1 and 2 of the GA3 trial showed that there is significant difference between treatments. According to the LSD test, the treatments of 2, 5, 7, 8 and Red Roucha have significant difference with control and others treatments. It means, the diameter of berry in treatment 2, 5, 7 and 8 are bigger than berries of other treatments. Although, treatment # 3 is off type, but all other treatments have significance on the berry diameter. Except the treatment # 4, all other treatments increased berry diameter than control in white Roucha.

6. Berry length

The statistical analysis on table 1 and 2 of the GA3 trial showed that there is significant difference between treatments. According to the LSD test, the treatments % 5, 6, 7, 8, 9 have significant difference with control in White Roucha. It means the length of berry in treatments 5, 6, 7, 8 and 9 are bigger than berries of other treatments in white Roucha.

In Red Roucha all treatments have significant differences on the berry length in Red Roucha compare to control.

7. Brix %

The quality data on table 1 and 2 of the GA3 trial showed that there is significant difference between treatments. According to the LSD test, all the treatments have significant difference with control. It means the brix % of berry in all treatments is higher than berries of control in both white and Red Roucha. It means, the GA3, thinned the berry and increased the brix content of berry. Although, in Red Roucha, the treatment # 3 was off type, but the remaining treatments produced high content brix grapes than control.

8. Berry firmness

The scoring system for berry firmness are firm = 1 and soft = 2.

The organoleptic data on table 1 and 2 of the GA3 trial showed that there were significant differences between treatments. According to the LSD test, all the treatments have significant effect on the berry firmness compare to the control in both Roucha varieties.

9. Berry color

The scoring system for berry firmness are Good = 1, medium = 2, poor = 3.

The organoleptic data on table 1 and 2 of the GA3 trial showed that there is significant difference between treatments. According to the LSD test, the treatment 2 (10 ppm GA3 before flowering on the treated bunch) has significant difference with control in white Roucha. But in Red Roucha, 2, 8 and 9 treatments have significant differences with control. It means, the color of berry in treatments 2, 4 and 6 are better than control. Picture-6: Collecting data



10. Taste

The scoring system for berry firmness:
Good = 1, medium = 2, poor = 3.

The organoleptic data on table 1 and 2 of the GA3 trial showed that there is significant difference between treatments. According to the LSD test, the treatments 5 and control in White Roucha have the same taste which is accepted by panel. In Red Roucha, the treatments of 2, 7, 8 and 9 have the same taste like control that accepted by panel.



Picture-7: Collecting data

Conclusions and Recommendations

The result of experiment has shown that treatment 7 (20 ppm at 40% flower opening +20 ppm at 80% flower opening on the treated bunch) for White Roucha and treatment number 3(10 ppm GA3 before flowering on the treated bunch) for Red Roucha are appropriate treatments for high yield.

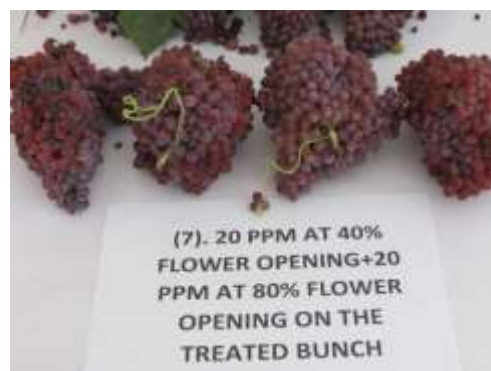
The results of the experiments have shown that the application of GA3 10 ppm before flower opening + 60 ppm GA3 at 4 mm berry size(treatment # 8) and treatment 9 (20 ppm GA3 before flower opening + 60 ppm GA3 at 4 mm berry) were significant in both White and Red Roucha varieties for producing of loose cluster.

Treatment pictures:

1. White Roucha



2. Red Roucha



II. Effect of gibberellin on flower thinning and berry sizing of Shondukhani, April-Oct., 2015

Researchers: Prof. Gh.R. Samadi, M.R. Yaqubi, Ahmad Shah Zarghon

M. Wali Adel,

Introduction

Many growers in Afghanistan, especially in Shamali plain, Kandahar and other areas use GA3 on seedless grape varieties such as Kishmeshi and Shondukhani for enlargement of berry size. The current problems include wrong timing of GA3 applications, and overdosing, which can promote tight berry clusters.

Methods and materials

The experiment was conducted to evaluate the effect of GA3 application on cluster compactness, quality improvement and production of Shondukhani variety of grapes in Shakardara district, Kabul provinces during April – Oct., 2015.

The trial was laid out in Randomized Complete Block Design with three vines per treatment, and then 3 replications (two clusters per replication from targeted vine randomly were selected).

Treatments:

Treatment 1: Control

Treatment 2: 10 ppm GA3 at 40% flower opening on the treated bunch

Treatment 3: 10 ppm GA3 at 40% flower opening +10 ppm at 80% flower opening on the treated bunch

Treatment 4: 20 ppm GA3 at 40% flower opening on the treated bunch

Treatment 5: 20 ppm GA3 at 40% flower opening +20 ppm at 80% flower opening on the treated bunch

Treatment 6: 20 ppm GA3 at berry size 4 mm

Treatment 7: 40 ppm GA3 at berry size 6 mm

Treatment 8: 60 ppm GA3 at berry size 8 mm

Treatment 9: 80 ppm GA3 at berry size 10 mm

After harvesting, the following data were collected, and then Analysis of variance and Least Significant Difference test (LSD) were made for most of the characters such as weight of cluster, cluster compactness, cluster length, berry diameter, berry length, brix %, berry firmness, berry color and taste.



Picture-8: Harvesting GA3 trial of Shondukhani grapes



Picture-9: Shondukhani grapes for data collections

Statistical Analysis

The experiment was analyzed as RCBD and LSD test was used for treatments comparison.

1. Effect of gibberellin on flower thinning and berry sizing of grapes (*var. Shondukhani*), April-Oct., 2015

Table-3: Yield and yield components of gibberellin on flower thinning and berry sizing of grapes (*var. Shondukhani*)

#	Treatments	Weight of cluster/gr	Cluster compactness	Cluster diameter/cm	Cluster length/ cm	Berry diameter mm	Berry length mm	Brix %	Berry firmness	Berry color	Taste
1	Control	356.5d	1.0 c	9.0 d	28 abc	10.25 e	18.9 5 e	24.0 5 b	2 a	2.5 ab	2 a
2	10 ppm GA3 at 40% flower opening on the treated bunch	522.5bc d	2.0 b	9.0 d	25.5 c	11.75 bc	20.5 de	23.3 bc	1.5 ab	1 c	1 c
3	10 ppm GA3 at 40% flower opening +10 ppm at 80% flower opening on the treated bunch	548.75b c	2.5 ab	10.0 bcd	25.5 c	11.10 cd	24 bc	22.9 5 bcd	2 a	1 c	2 a
4	20 ppm GA3 at 40% flower opening on the treated bunch	468.5bc d	2.0 b	10.25 bc	28.5 abc	11.15 bcd	25.2 5 bc	22.5 cd	1.5 ab	1 c	2 a
5	20 ppm GA3 at 40% flower opening +20 ppm at 80% flower opening on the treated bunch	523.25b cd	2.0 b	9.75 bcd	28 abc	11.7 bc	23 cd	23.9 bc	1.5 ab	2 b	1.5 b
6	20 ppm GA3 at berry size 4 mm	616b	2.5 ab	9.25 cd	30.75 a	11.85 b	26.5 b	23 bcd	1 b	2 b	2 a
7	40 ppm GA3 at berry size 6 mm	616.75b	2.75 ab	10.5 b	28 abc	10.85 de	25.4 bc	23.1 5 bcd	1 b	2 b	2a
8	60 ppm GA3 at berry size 8 mm	402.5cd	2.0 b	9.75 bcd	29.25 ab	11.25 bcd	25.2 5 bc	27.1 5 a	1 b	3 a	2 a
9	80 ppm GA3 at berry size 10 mm	826.25a	3 a	3 a	26.5 bc	13.10 a	31.9 a	21.8 d	1 b	1 c	1 c

Grand mean	542.22	2.19	10.06	27.78	11.44	24.97	23.53	1.39	1.72	1.72
F-test	**	**	**	Not significant	**	**	**	*	**	**
LSD at 5 %	170.3	0.8574	1.201	3.742	0.7433	2.725	1.487	0.6967	0.6006	0.4560
CV %	18	23	7	8	4	6	4	29	20	15

Means within the same column followed by the same letter are not different at 5% level of significance.

Results and Discussions

1. Weight of cluster

The yield data on table 1 of the GA3 trial showed that there is significant difference between treatments. According to the LSD test, treatment 9 (80 ppm GA3 at berry size 10 mm) on the treated bunch of Shondukhani) has significant difference with control and other treatments. It is mentionable that there is no significant different between treatments 2, 3, 4, 5, 6 and 7 on berry weight. It means, the mentioned treatments have also good effect on weight of cluster. The treatment 9 (80 ppm GA3 at berry size 10 mm) has highly increased the yield of Shondukhani grapes.

2. Cluster compactness

The scoring system for cluster compactness are compact = 3, medium = 2 and loose = 1.

The statistical analysis of the GA3 trial in table 1 shows that there is significant difference between treatments. According to the LSD test, the treatment 9 has significant difference with control in Shondukhani. The application of GA3@ 80 ppm at 10 mm berry size has produced compact cluster, but it was marketable. There are no significant differences among the treatments 2, 3, 4, 5, 6, 7 and 8 on cluster of compactness.

3. Cluster length

The yield data on table 1 of the GA3 trial shows that there is no significant difference between treatments. According to the LSD test, none of the cluster length treated bunches are longer compare to the check. But among the treatments, 40 ppm GA3 at 4 mm berry size and 60 ppm GA3 at 8 mm berry size produced long clusters. Genetically, Shondukhani grapes are produced long cluster compare to the other grapes.

4. Cluster diameter

The yield data on table 1 of the GA3 trial showed that there is significant difference between treatments. According to the LSD test, the treatment 9 (80 ppm GA3 at berry size 10 mm), has significant difference with control and others treatments. It means, the diameter of cluster in treatment 9 is bigger than clusters of other treatments. The treatments 3, 4, 5, 7 and 8 produced the wide clusters than control.

5. Berry diameter

The yield data on table 1 of the GA3 trial showed that there is significant difference between treatments. According to the LSD test, the treatment 9 (80 ppm GA3 at berry size 10 mm) has significant difference with control and others treatments. It means, the diameter of berry in treatment 9 is bigger than berries of other treatments. The treatments 2, 4, 5, 6 and 8 gave the good size berry diameter than control, while the treatment # 9 produced biggest berry at the size of 13.10 mm berry while the control one produced 10.25 mm and other treatments.

6. Berry length

The statistical analysis on table 1 of the GA3 trial showed that there is significant difference between treatments. According to the LSD test, treatment 9(80 ppm GA3 at berry size 10 mm) has bigger than berries of other treatments. Also the treatments 4, 6, 7 and 8 have good effect of berry length.

7. Brix %

The quality data on table 1 of the GA3 trial showed that there is significant difference between treatments. According to the LSD test, all the treatments have significant difference with control. It means the brix % of berry in treatment 8(60 ppm GA3 at berry size 8 mm) is higher than berries of all other treatments. The amount of brix % in treatments # 3, 4, 6, 7 and 9 compare to control were less. It means, the GA3, increased the size of berry and decreased the brix content of berry. In Shondukhani grapes, control, treatments 2, 3, 4, 5, 6, 7, 8 and 9 produced 24.05, 23.3, 22.95, 22.5, 23.9, 23, 23.15, 27.15 and 21.8 brix degrees respectively.

8. Berry firmness

The scoring system for berry firmness are firm = 1 and soft = 2.

The organoleptic data on table 1 of the GA3 trial showed that there is significant difference between treatments. According to the LSD test, only the treatment 6, 7, 8 and 9 have good effect on berry firmness compare to the control. It means, GA3 at level of 20, 40, 60 and 80 ppm have good effect on berry skin firmness.

9. Berry color

The scoring system for berry firmness are Good = 1, medium = 2, poor = 3.

The organoleptic data on table 1 and 2 of the GA3 trial showed that there is significant difference between treatments. According to the LSD test, the treatments 2, 3, 4, and 9 have good effect on berry color. The color of fruits in mentioned treatments were better.

10. Taste

The scoring system for berry firmness: Good = 1, medium = 2, poor = 3.

The organoleptic data on table 1 of the GA3 trial showed that there is significant difference between treatments. According to the LSD test, the grapes of treatments # 2 and 9 had better taste than control and other treatments. The taste of control and others treatments Shondukhani grapes had fair taste as well.



Picture-10: Sensory test

Conclusions and Recommendations

The result of experiment has shown that treatment (80 ppm GA3 at berry size 10 mm) is appropriate treatment for high yield, good quality and marketability for Shondukhani grapes.

Treatment pictures:



